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APPENDIX C

PUBLIC MEETING TRANSCRIPT

PROPOSED PLANS FOR
SITE 3 - NEW SOURCE AREA SOIL;
SITES 7 AND 14 SOIL (OU8); AND
SITES 16 AND 18 SOIL (OU11)

Public hearing taken at the Best Western Olympic Inn, 360 Route 12, Groton, Connecticut, before Clifford Edwards, LSR, Connecticut License No. SHR.407, a Professional Shorthand Reporter and Notary Public, in and for the State of Connecticut on July 28, 2004, at 6:41 p.m.

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SITE 3 - NEW SOURCE AREA SOIL;
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APPEARANCES:

COREY A. RICH, PE
TETRA TECH NUS, INC.
611 Andersen Drive
Pittsburgh, PA 15220

MARK D. EVANS
NAVFAC
10 Industrial Highway
Mail Stop #82
Lester, PA 19113

ALSO PRESENT:
KYMBERLEE KECKLER
MELISSA COKAS
FELIX PROKOP
LARRY GIBSON
MARK LEWIS

PROCEEDINGS

MR. EVANS: Corey was going to give some technical presentations on each individual site real quick -- well, a little quicker now.

At the end of that presentation, we were going to give anybody that wanted to actually make a formal comment that would actually be part of the public record a chance to do that.

At that point, you can stand, state your name so that the stenographer can get that and it will actually be part of the public record. Okay?

MR. RICH: Thank you, Mark.

As you're all aware, my name is Corey Rich. I work with Tetra Tech NUS. We're a consultant for the Navy. We're here tonight to talk about three proposed plans that were issued back on July 16.

The three proposed plans cover the soil operable units at Site 3, SiteS 7 and 14, which are listed as OU8 -- which is designated as OU8, Sites 16 and 18 soil, which are designated as OU11.

As Mark said, we're going to go through some technical presentations on the three proposed plans and I'm going to start off with a quick review of the regulatory process.

The Comprehensive Environmental Response Compensation Liability Act, or CERCLA, has a set process we need to go through. These sites we've investigated and are here to discuss -- are covered under CERCLA.

The first step is to go through a preliminary assessment or site inspection, let's us know if there's a potential problem at that site.

If that shows that there's an issue, we go into a remedial investigation which is a more in-depth look at that site, and what you try and do is find out what's there, what type of contamination and who will it impact or what.

With a feasibility study, we try to determine what we do with what's there, determine the approach for cleaning it up.

Once we go through and determine that approach, we need to present that information in a proposed plan, which we're here to do tonight, and we take the multiple alternatives that were looked at in the FS and select one of those and present it to the public.

We need to then formally document that in a record of decision and incorporate any public input we got during our public meeting with a Responsiveness Summary.

After we come up with our alternative and document it in the ROD, we have to come up with a remedial design and how we are going to implement that remedy and actually go out and do the remedy itself during remedial action, and then we have to monitor things through operations and maintenance.

Just quickly give you some more in-depth information on the proposed plan and record of decision. The proposed plan is a document used to facilitate public involvement in the CERCLA process.

It presents the lead agencies preferred alternatives, presents the alternatives evaluated and the reasons for recommending that preferred alternative, and it's a public participation requirement under CERCLA and the NCP.

The record of decision is a legal document that's prepared by

the lead agency and with the support of the -- support agencies, in this case, the EPA and the State of Connecticut, and it certifies that the remedy was selected following the CERCLA and NCP process.

It provides the technical rationale and background information that's provided in the admin record and identifies the engineering components and outlines remedial actions and objectives and cleanup goals for the remedy. And it's a tool to explain to the public the problems the remedy seeks to address and the rationale for its selection.

I'll go through the first site, Site 3, new source area. Just some brief details about the site. It's located in the northern part of the sub base. Hopefully you can see this map of the sub base over here.

This is the northern end of the sub base. Site 3 itself is

this area. And Site 3 new source area is just a small area right about there.

It's about six-hundredths of an acre.

It was an abandoned disposal area. Some rusted drums and wire cable are visible at the site. It was detected or found during the OU3 Site 3 remedial action.

It's petroleum contamination was found at that time and the site was not cleaned up at that time because we needed to determine what the nature and extent of that contamination was.

But there were some temporary measures put into place to minimize further contaminant migration until we could study the site and implement the remedy.

Mark, can you show us --

This is just a blowup really of our larger scale figure over

there. Mark's pointing to the new source area there just to give you an idea. There's the torpedo shops. This is the Area A Downstream, Site 3. Stream 5 of the Area A Downstream runs adjacent to Site 3 new source area.

Just minimize that.

Okay. This is a picture of the site.

You can see the rusted drum here and here, and some wire cable there. Just another view of the site looking in the southerly direction. Stream 5 is right here. This is Triton Road, and the golf course is over there.

Just a quick summary of the nature and extent of contamination. The site was investigated during a data gap investigation. The data and results were presented in the basewide ground water operable unit remedial investigation update and feasibility

study that was finalized in July of 2004.

In general, the main contamination found was TPH, or petroleum contamination, and we did see some stained soil and some free petroleum oil on the water surface out there. We've estimated about 385 cubic yards is contaminated and will need to be addressed.

We also found some polynuclear aromatic hydrocarbons, or PAHs, in a small area just adjacent to Triton Road, which was a surface soil sample that we had.

And in evaluation of that some more, we determined it was related to the actual asphalt pavement. We may have picked up a little asphalt in our sample or something like that that skewed our results.

We also saw some low level concentrations of some other

compounds, volatile organics, some pesticides, one PCB, and some inorganics.

Show the slide. Just maximize that.

This is a cross-section through the site itself. That disposal area is up here.

This is Stream 5, Triton Road.

What we have found is there's kind of a smear zone of contamination right along the bedrock interface and water table.

Looks like some oil was released from those rusted drums and has migrated into the subsurface and down along that bedrock interface.

We went through a risk assessment for this site, both human health and ecological risk assessments. Generally the only thing we found there was TPH or petroleum.

And there were generally

no risks for the contaminants other than TPH, but the TPH did exceed Connecticut standards which shows a potential issue there. It poses both a direct exposure concern and a contaminant migration concern.

We also looked at eco risks and we didn't really see any significant risks from the non-TPH contaminants out there, but with there being some mobile free product there, that would pose a potential issue to the ecological receptors.

So the overall results of the risk assessment showed that TPH was our main contaminant of concern.

So we went into a feasibility study to determine the appropriate approach for addressing the issues, the TPH contamination, and basically we want to protect current receptors.

That would be construction workers, somebody out their digging,

putting in sewer lines, something like that, current employees or a trespasser from any exposure to the contaminated soil.

We also want to protect any groundwater that's at the site. We also want to protect any aquatic ecological receptors in Stream 5 adjacent to the site, and also protect any potential future residents that may live in that area if the base would subsequently be closed or something like that.

When we went into the feasibility study, we looked at general response actions or main approaches for addressing this contamination and then looked at process options and technologies and went through a screening process and honed it down to three different alternatives that would be appropriate for the TPH contamination out there.

We have to include a no

action alternative under CERCLA for comparison purposes. We looked at a, basically a passive alternative of institutional controls, just limiting access to the site.

Because it is petroleum, it naturally degrades, we have some natural degradation that would occur on the site which hopefully would eventually clean up on its own. Just by restricting access, we would eliminate any risks to the public or environment and do some limited monitoring just to confirm that.

Or our third alternative Is a more aggressive approach: We actually go out and excavate and remove the contaminated soil and dispose of that off site, get rid of the problem.

Go back one second.

Each of these alternatives, I have a present worth cost at the end of them.

Obviously no action would be zero dollars.

Institutional controls would run about $124,000 over a 30-year life cycle, and excavation and off-site disposal would be about $286,000.

Each of those alternatives go through an evaluation or evaluation process against seven main criteria and then two modifying criteria. Within the FS itself, these seven criteria are evaluated -- or each alternative is evaluated with these criteria.

These threshold criteria are mandatory; the alternatives need to meet these. The balancing criteria are more subjective or qualitative evaluation criteria.

And then the modifying criteria of state acceptance and community acceptance provides the Navy with input from both the state and the

public on their alternatives and helps keep all parties informed and involved in the decision-making process.

For Site 3, based on that evaluation and regulatory input -- I guess let me take one step back.

The petroleum contamination that was found at this site isn't directly covered under CERCLA, and there were no risks from the CERCLA-related contaminants at the site.

So what the Navy is proposing under CERCLA is no further action for this site because there were no risks from the non-TPH contaminants at the site.

But they understand there's a concern from the petroleum and they have selected alternative S3, which is excavation and off-site disposal for the contaminated soil, and that cleanup would be done under the Connecticut regulations and

meeting a TPH of 500 milligrams per kilogram and eliminating the mobile free product out there.

The 500 milligrams per kilogram level would meet residential reuse requirements.

And as part of that alternative, they would go in and do some minor additional characterization just to clarify the size of the area, the volume. They would go through that predesign investigation and then do an actual design, remedial design for the site.

It's anticipated they will need to construct a temporary road to maintain access to the torpedo shops and the weapons center which are located east on Triton Road.

They would go in and excavate the contaminated soil, characterize it with some verification -- with testing and then they would take it off site and

dispose of it. There's a possibility, if they can, they would recycle it through asphalt paving plants or something like that.

They might be able to recycle that material.

In the bottom of the excavation itself, they will collect verification samples to make sure they meet the 500 milligram per kilogram cleanup goal, and they'll restore the site to its preexcavation conditions.

The whole process of design and remediation is anticipated to take a year and a half. The actual in-field excavation work would take about two to three months.

So moving on to the next site, Site 7, which is part of Operable Unit 8, there are several buildings that are designated as the torpedo shops in the northern portion of New London. The Navy conducts maintenance activities at these

buildings for torpedos. They use solvents and petroleum products. Through that process, they store them there and also use them.

Next slide. This is just a picture of Building 325, one of the larger buildings of the four and one of the main areas where maintenance activities are completed.

This is also a picture of Building 450. Again, one of the larger buildings where maintenance activities are completed.

The site was investigated During three different phases: The Phase 1 RI back in the early '90s, the Phase 2 RI in the mid '90s, and basewide groundwater OU RI in early 2000.

Soil data was reevaluated in our RI update and feasibility study this year and, in general, we found during our investigations two areas of contamination, one being an area

contaminated with polynuclear aromatic hydrocarbons, that being south of Building 325.

And it looks like this is related to some former leakage or spillage of some fuel oil tanks in that area, and it looks like there's possibly 1,700 cubic yards of contaminated soil in that area.

We also have on the western side of Building 325 an area of contamination or suspected contamination. We found some groundwater contamination in that area just adjacent to a former septic tank that was used until the early 1980s, and it looks like there may be residual contamination in that area leaching into the groundwater and causing a problem.

Excuse me. Yeah, we can take a look at the figure.

This figure is from the feasibility study and just shows those

two areas in a little more detail. This is the PAH contamination area with cross-hatching on it. We had two hits generally in the subsurface.

This sample was from 1 to 3 feet, and this one is from 6 to 8 feet below -- no, that's 1 to 3 as well.

Contaminant levels are around 1,700 to 2,000 micrograms per kilogram range, which exceed Connecticut's cleanup goals.

And then the septic tank area is over here. There was a septic tank and that drained off into this leach field, and we believe that that historic septic tank is still in place and maybe has some sludge or something in there that's acting as a source.

We went through the risk assessment process and the PAH soil poses a potential contaminant migration issue as well as potential risks to human receptors, and the

solvent area causes a definite -- causes risks to human receptors through groundwater at this point in time. The soil data didn't confirm a risk from the soil, but we're going to confirm that information.

No significant ecological risks based on the site. As you saw on those pictures, most of the site is paved. The ecological receptors really don't have access to the site.

So our contaminants of concern for the soil are the PAHs, the benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene, and then the solvents, the benzene, chlorobenzene, and 1,4-dichlorobenzene.

The remedial action objectives that we came up with, very similar to the other ones that we had for Site 3. We want to protect current receptors from the contaminated soil, protect the

groundwater from contaminants in the soil leeching to it, protect any aquatic receptors.

We generally didn't have any of these main issues, but we still wanted to state that we're protecting them and we also want to protect any future receptors if this facility would be shut down and this would be reused for residential purposes.

We have came up with three very similar alternatives as we had for Site 3 new source area, a no-action, which is mandatory under five-year reviews.

Because we had some additional contaminants, CERCLA contaminants of concern, we would have to do five-year reviews under a no-action scenario and that would give us a cost compared to the Site 3 new source area which had none.

Alterative 2 is a passive institutional controls alternative

prohibiting access to the site, allowing natural degradation to occur, conducting our reviews and doing periodic testing.

And then Alternative 3 would be excavation and off-site disposal.

The cost for Alternative 2 is $98,000.

Alternative 3, approximately $440,000.

We screened all the alternatives with a similar set of criteria, and the Navy's preferred remedy for the soil at Site 7 is Alternative S3, which is excavation and off-site disposal.

They will do some additional characterization to finalize the delineation of the contaminated soil, and they want to locate and sample any contents in the septic tank. That will be done as part of a predesign investigation.

They'll conduct a remedial design and then the actual remedial action will include excavation, characterization, transportation, and disposal of the contaminated soil and tank off site and verification sampling to confirm that we've gotten all the contaminated soil out of the ground. Then restore the site and similar time frames for the total project duration and remedial action.

These are the remedial goals for the soil at Site 7. These goals are based on Connecticut remediation standards. They meet both direct exposure and contaminant migration concerns.

Site 7 is one part of OU8. The other part of Operable Unit 8 is overbank disposal area northeast, which is OBDANE for abbreviation.

Site 14 is located adjacent to Sites 3 and 7. It was a small disposal area where

miscellaneous waste was dumped over the edge of a ravine in the past. This is a picture of the site, I believe in early or maybe late 2000 early 2001. This was after Stream 3 was remediated as part of the OU3 remedial effort.

The site was originally investigated during two phases in the early and mid 1990s. We found some low level VOCs, volatile organic compounds, PAHs and pesticides, and some slightly higher levels of inorganics, in particular, arsenic and lead.

Taking that information into the risk assessment, we didn't see any significant risks to human health related to those contaminants, but we did see some risk to ecological receptors because of those contaminants of concern. So our contaminants of concern for this site were pesticides and inorganics, and

originally the Phase 2 RI recommended that we do some further characterization, but -- next slide.

The Navy opted to go in and do a removal action at the site and they performed an engineering evaluation and cost analysis which is a streamlined feasibility study and then signed an action memorandum for that site which is a kind of a streamlined record of decision for a removal action.

They went in and completed that removal action in 2001. They took out about 270 tons of debris and contaminated soil and disposed of that off site.

They selected remedial goals for pesticides and inorganics from both the State of Connecticut criteria and previously selected remedial goals that were used during the Site 3 removal -- remedial action that was conducted, and those Site 3

goals were based on ecological receptors which was the concern that was identified for Site 14.

You want to look at the figure quick, Mark. If you go down and fit the -- This figure just gives you a plan view, and this line outlines the limit of excavation for the removal action. And this is Stream 3, the stream that was visible on that earlier figure. This is upper pond. This is Triton Road.

And this picture shows us postremoval action. That area has been cleaned up, reseeded, and you can still see some of the silt fence down along the lower edge of the site.

So since the removal action was done and all the debris and contaminated soil has been removed, the Navy proposes no further action for this site under CERCLA and this site will be written off then.

So that was OU8.

Now we are going to move on to Operable Unit 11. This was another proposed plan. The two sites included are Sites 16, the hospital incinerators, and site 18, the solvent storage area of Building 33. I'll talk about Site 16 first.

Site 16 consisted of two locations where a mobile incinerator was used next to the hospital.

Want to look at the figure there, Mark?

The main hospital area is Building 449. Based on best information available, the incinerator was used in this area and also over on the edge of the parking lot in this area back in the '80s, I guess, late '70s time frame.

And it was -- the incinerator was used to destroy medical records and medical waste. And from what everybody -- from all records and information that we

have received, the ash was disposed of off site at a municipal landfill. So we weren't really expecting significant issues at this site, but we wanted to go through the process and evaluate it.

These are just two pictures of those areas that we outlined on the plan view drawing. This is Location A and this is Location B.

This site was actually looked at back in the early '80s under the initial assessment study.

It was recommended at the time to delay any further investigation because it was still operational and they were still using it. They ceased operation in the late '80s, early '90s, and we investigated this site in early 2000.

Some soil samples were collected at the site and analyzed for organic compounds, pesticides, PCBs,

dioxins/furans, inorganics, and we also did some leachability testing on the soil samples.

We also went through risk assessment, mainly a human health risk assessment, and the data did not show a significant risk to human receptors. The site itself doesn't provide any significant suitable ecological habitat so we didn't conduct an ecological risk assessment.

We did, through our data screening, identify some potential contaminant migration concerns with contaminated soil possibly impacting groundwater.

We took a look at some background concentrations and the leachability test results and used that information to show there really weren't any significant concerns related to those potential contaminants.

The Navy recommends no

further action for Site 16 soil based on the information that's available. And they will pursue that, no further action.

Site 18, the other part or other site included in Operable Unit 11, is located in the southern part of New London just north of Sites 15 and 23. Just give you a quick look at Site 18 is down here, Site 16 is up here.

This figure shows you some of the sample locations that were used to evaluate the site, and then Site 15 is spent acid storage and disposal area and the tank farm, Site 23, were located south of the site.

The building was used for storage of gas cylinders and 55-gallon drums of solvents such as TCE or trichloroethylene or dichloroethylene. This gives you a picture, just an old warehouse.

We investigated the site

in early 2000, collected soil samples, analyzed them for broad range of compounds and also did some leachability tests and, in general, we didn't find much contamination at all in the soil out at the site. Some low concentrations of volatile organic compounds and polynuclear aromatic hydrocarbon and some inorganics, but this is one of the cleanest area on the facility.

We didn't see any significant risks to human health from the building in general, and this surrounding parking lot didn't provide an ecological habitat so no ecological risk assessments were completed. And we didn't see any potential migration issues from the contaminants found in the site.

So the Navy's preferred alternative for this site is no action because no significant risk or environmental concerns.

So those are the Navy's preferred remedies. We are in the middle of the public comment period right now. The comment period started on July 16 with the issuance of a public notice in The Day newspaper and we'll wind up on August 17.

We are currently conducting the public meeting.

Once the public comment period is over, if there are any comments received, the Navy will put together a responsiveness summary which is formal responses to any of the comments received and that information will get incorporated into the records of decision.

And we hope to have our records of decision -- there will be three separate ones associated with these three proposed plans -- out in the September to October 2004 time frame.

Points of contact, these

Folks are all in attendance tonight: Mr. Mark Evans provided our introduction; Ms. Melissa Cokas is at the subase in charge of the environmental program there; Ms. Kymberlee Keckler from the EPA; and Mr. Mark Lewis from the State of Connecticut.

That's the end of the technical presentation. With no comments during the presentation, do we want to open the floor for any formal comments from the public?

MR. GIBSON: Larry Gibson. It was a very good and comprehensive presentation, and I agree with all the decisions that have been recommended so for.

MR. EVANS: Thank you.

MR. PROKOP: For the record, my name is Felix Prokop. I'm with the Ledyard Health District. And we cover the Town of Groton and, in the last

year or two, we cover Ledyard. In early February, we have been taken over as far as the environmental health, the wells, the septic system, and things like that, and I've been to these meetings for years as you guys know.

Was there any problems on the Groton site or Ledyard site, you know, Route 12, Military Highway, Long Cove, any problem with well contamination?

I remember some years ago, some wells claimed they had a boron problem. I remember -- I forgot, this happened so many years ago, I did take samples for boron for somebody in the public and there didn't tend to be much.

Was there any problem in those wells that you know of?

MR. EVANS: No. There was, I think it was way back in the Phase 1 RI that Atlantic completed, boron was

showing up at high levels in every sample they took or a lot of samples they took.

MR. PROKOP: Where were they -- in what? On the base?

MR. EVANS: Mainly the monitoring wells. I don't think they ever saw any residential wells. Most of the residential wells were gone by then or starting to be decommissioned.

MR. PROKOP: Shortly after that, the water line --

MR. EVANS: Then the water line came up to Route 12, yeah. The boron only showed up on that one round and all indications were it was some sort of lab contaminant screwup at that time.

MR. PROKOP: But the best you know, there was no contaminated wells?

MR. EVANS: No. Remember up on Route 12, there were some residences up there on the northern

end that the Navy bought all that property because it was in the explosive arc?

Other than that, I don't think we know of any residential wells still.

MR. PROKOP: I mean, nobody had to tie into public water because -- because I went through those records pretty thorough and I didn't see anything.

MR. EVANS: I don't think so either.

MR. PROKOP: Okay.

MR. EVANS: The other thing is most of the groundwater flows from the sub base towards the Thames River, away from --

MR. RICH: There's very little, if any, flow off property in that direction.

MR. PROKOP: Was there any surveys done in that area? Did anybody do any spot wells in that

area?

MR. RICH: The Navy did.

MR. EVANS: Seems we did during Phase 2. I think during Phase 2 RI, we did some of that work.

MR. PROKOP: Do you remember where?

MR. EVANS: No.

MR. RICH: There's a report.

MR. EVANS: A separate report?

MR. RICH: Yeah, that Atlantic prepared. There's probably a dozen or more public wells that were sampled.

MR. PROKOP: Public or private?

MR. RICH: Private, I'm sorry.

MR. EVANS: Yeah, it's coming back to me now that we did do a report like that.

MR. PROKOP: That's all I have.

MR. EVANS: Those reports are probably in the admin record now. We have updated that.

Did you put a copy of that in the library yet?

MS. COKAS: No.

MR. EVANS: We've updated those CDS.

I think we're up to 13 CDs that have every document that we've ever prepared. As soon as that's finalized, those will be in the two libraries.

You can go in there and take a look at any of those documents. It's pretty easy to search the stuff on them.

MR. PROKOP: I'm the only guy in the office without a computer. Leave it that way. But I'm sure if there was a problem, it would have been --

MR. EVANS: We can use the library's computers for those, right?

MS. COKAS: I believe so. I wasn't there when they brought the first set, so I didn't really talk to the library about it.

MR. RICH: If that's all the questions, then --

MR. EVANS: We'll stick around a little bit if you guys want to take a look at the posters and stuff.

MR. RICH: The meeting is adjourned.

(THEREUPON, THE HEARING WAS CONCLUDED AT 7:24 P.M.)

CERTIFICATE

I hereby certify that said hearing was taken by me stenographically in the presence of counsel and reduced to typewriting under my direction, and the foregoing is a true and accurate transcript of hearing.

I further certify that I am neither of counsel nor attorney to any of the parties of said cause, nor am I an employee of either party to said cause, nor of either counsel in said cause, nor am I interested in the outcome of said cause.

Witness my hand and seal as Notary Public this 30th day of August, 2004.

Clifford Edwards

Clifford Edwards
Notary Public
My commission expires: 9/30/2006

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APPENDIX D

HUMAN HEALTH RISK ASSESSMENT, RAGS PART D TABLES

LIST OF TABLES
RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.

REASONABLE MAXIMUM EXPOSURES

CENTRAL TENDENCY EXPOSURES

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	1.5E-08	--	3.2E-09	--	1.9E-08	NA	--	--	--	--
			Benzo(a)pyrene	2.1E-07	--	4.4E-08	--	2.6E-07	NA	--	--	--	--
			Benzo(b)fluoranthene	6.1E-08	--	1.3E-08	--	7.4E-08	NA	--	--	--	--
			Dibenzo(a,h)anthracene	1.1E-07	--	2.3E-08	--	1.3E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.3E-08	--	2.6E-09	--	1.5E-08	NA	--	--	--	--
			Arsenic	1.9E-07	--	8.9E-09	--	2.0E-07	Skin, CVS	0.03	--	0.001	0.03
			Manganese	--	--	--	--	--	CNS	0.01	--	--	0.01
			Mercury	--	--	--	--	--	CNS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	NOAEL	0.04	--	--	0.04
			Chemical Total	6.0E-07	--	9.4E-08	--	7.0E-07		0.08	--	0.001	0.09
		Exposure Point Total						7.0E-07					0.09
	Exposure Medium Total							7.0E-07					0.09
Medium Total								7.0E-07					0.09
Receptor Total							Receptor Risk Total	7.0E-07				Receptor HI Total	0.09

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibiltiy Study (TtNUS, 2004).

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	1.0E-07	--	1.0E-07	--	2.0E-07	NA	--	--	--	--
			Benzo(a)pyrene	1.4E-06	--	1.4E-06	--	2.8E-06	NA	--	--	--	--
			Benzo(b)fluoranthene	4.0E-07	--	3.9E-07	--	7.9E-07	NA	--	--	--	--
			Dibenzo(a,h)anthracene	7.3E-07	--	7.2E-07	--	1.4E-06	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	8.4E-08	--	8.3E-08	--	1.7E-07	NA	--	--	--	--
			Arsenic	1.2E-06	--	2.8E-07	--	1.5E-06	Skin, CVS	0.008	--	0.002	0.009
			Manganese	--	--	--	--	--	CNS	0.003	--	--	0.003
			Mercury	--	--	--	--	--	CNS	0.006	--	--	0.006
			Vanadium	--	--	--	--	--	NOAEL	0.01	--	--	0.01
			Chemical Total	3.9E-06	--	2.9E-06	--	6.9E-06		0.03	--	0.002	0.03
		Exposure Point Total						6.9E-06					0.03
	Exposure Medium Total							6.9E-06					0.03
Medium Total								6.9E-06					0.03
Receptor Total							Receptor Risk Total	6.9E-06				Receptor HI Total	0.03

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	5.2E-08	--	4.3E-08	--	9.5E-08	NA	--	--	--	--
			Benzo(a)pyrene	7.3E-07	--	5.9E-07	--	1.3E-06	NA	--	--	--	--
			Benzo(b)fluoranthene	2.1E-07	--	1.7E-07	--	3.8E-07	NA	--	--	--	--
			Dibenzo(a,h)anthracene	3.8E-07	--	3.1E-07	--	6.9E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.4E-08	--	3.6E-08	--	7.9E-08	NA	--	--	--	--
			Arsenic	6.4E-07	--	1.2E-07	--	7.6E-07	Skin, CVS	0.010	--	0.002	0.01
			Manganese	--	--	--	--	--	CNS	0.004	--	--	0.004
			Mercury	--	--	--	--	--	CNS	0.008	--	--	0.008
			Vanadium	--	--	--	--	--	NOAEL	0.01	--	--	0.01
			Chemical Total	2.0E-06	--	1.3E-06	--	3.3E-06		0.04	--	0.002	0.04
		Exposure Point Total						3.3E-06					0.04
	Exposure Medium Total							3.3E-06					0.04
Medium Total								3.3E-06					0.04
Receptor Total							Receptor Risk Total	3.3E-06				Receptor HI Total	0.04

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibiltiy Study (TtNUS, 2004).

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

SITE 3 - NSA SOIL ROD

NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	2.3E-07	--	5.9E-08	--	2.8E-07	NA	--	--	--	--
			Benzo(a)pyrene	3.1E-06	--	8.1E-07	--	3.9E-06	NA	--	--	--	--
			Benzo(b)fluoranthene	8.9E-07	--	2.3E-07	--	1.1E-06	NA	--	--	--	--
			Dibenzo(a,h)anthracene	1.6E-06	--	4.2E-07	--	2.0E-06	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.9E-07	--	4.9E-08	--	2.4E-07	NA	--	--	--	--
			Arsenic	2.7E-06	--	1.6E-07	--	2.9E-06	Skin, CVS	0.07	--	0.004	0.08
			Manganese	--	--	--	--	--	CNS	0.03	--	--	0.03
			Mercury	--	--	--	--	--	CNS	0.05	--	--	0.05
			Vanadium	--	--	--	--	--	NOAEL	0.1	--	--	0.1
			Chemical Total	8.8E-06	--	1.7E-06	--	1.1E-05		0.3	--	0.004	0.3
		Exposure Point Total						1.1E-05					0.3
	Exposure Medium Total							1.1E-05					0.3
Medium Total								1.1E-05					0.3
Receptor Total							Receptor Risk Total	1.1E-05				Receptor HI Total	0.3

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibiltiy Study (TtNUS, 2004).

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	9.7E-08	--	3.3E-08	--	1.3E-07	NA	--	--	--	--
			Benzo(a)pyrene	1.3E-06	--	4.6E-07	--	1.8E-06	NA	--	--	--	--
			Benzo(b)fluoranthene	3.8E-07	--	1.3E-07	--	5.1E-07	NA	--	--	--	--
			Dibenzo(a,h)anthracene	7.0E-07	--	2.4E-07	--	9.4E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	8.0E-08	--	2.8E-08	--	1.1E-07	NA	--	--	--	--
			Arsenic	1.2E-06	--	9.4E-08	--	1.3E-06	Skin, CVS	0.008	--	0.0006	0.008
			Manganese	--	--	--	--	--	CNS	0.003	--	--	0.003
			Mercury	--	--	--	--	--	CNS	0.006	--	--	0.006
			Vanadium	--	--	--	--	--	NOAEL	0.01	--	--	0.01
			Chemical Total	3.8E-06	--	9.9E-07	--	4.8E-06		0.03	--	0.0006	0.03
		Exposure Point Total						4.8E-06					0.03
	Exposure Medium Total							4.8E-06					0.03
Medium Total								4.8E-06					0.03
Receptor Total							Receptor Risk Total	4.8E-06				Receptor HI Total	0.03

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	5.2E-09	--	2.1E-10	--	5.4E-09	NA	--	--	--	--
			Benzo(a)pyrene	7.1E-08	--	2.9E-09	--	7.4E-08	NA	--	--	--	--
			Benzo(b)fluoranthene	2.0E-08	--	8.4E-10	--	2.1E-08	NA	--	--	--	--
			Dibenzo(a,h)anthracene	3.7E-08	--	1.5E-09	--	3.9E-08	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.3E-09	--	1.8E-10	--	4.5E-09	NA	--	--	--	--
			Arsenic	6.3E-08	--	6.0E-10	--	6.3E-08	Skin, CVS	0.010	--	0.00009	0.010
			Manganese	--	--	--	--	--	CNS	0.004	--	--	0.004
			Mercury	--	--	--	--	--	CNS	0.0008	--	--	0.0008
			Vanadium	--	--	--	--	--	NOAEL	0.01	--	--	0.01
			Chemical Total	2.0E-07	--	6.3E-09	--	2.1E-07		0.03	--	0.00009	0.03
		Exposure Point Total						2.1E-07					0.03
	Exposure Medium Total							2.1E-07					0.03
Medium Total								2.1E-07					0.03
Receptor Total							Receptor Risk Total	2.1E-07				Receptor HI Total	0.03

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
SITE 3 - NSA SOL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	1.2E-08	--	2.4E-09	--	1.4E-08	NA	--	--	--	--
			Benzo(a)pyrene	1.7E-07	--	3.3E-08	--	2.0E-07	NA	--	--	--	--
			Benzo(b)fluoranthene	4.8E-08	--	9.4E-09	--	5.7E-08	NA	--	--	--	--
			Dibenzo(a,h)anthracene	8.7E-08	--	1.7E-08	--	1.0E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.0E-08	--	2.0E-09	--	1.2E-08	NA	--	--	--	--
			Arsenic	1.5E-07	--	6.7E-09	--	1.5E-07	Skin, CVS	0.004	--	0.0002	0.004
			Manganese	--	--	--	--	--	CNS	0.001	--	--	0.001
			Mercury	--	--	--	--	--	CNS	0.003	--	--	0.003
			Vanadium	--	--	--	--	--	NOAEL	0.005	--	--	0.005
			Chemical Total	4.7E-07	--	7.1E-08	--	5.4E-07		0.01	--	0.0002	0.01
		Exposure Point Total						5.4E-07					0.01
	Exposure Medium Total							5.4E-07					0.01
Medium Total								5.4E-07					0.01
Receptor Total							Receptor Risk Total	5.4E-07				Receptor HI Total	0.01

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.3.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
SITE 3 - NSA SOIL ROD
CENTRAL TENDENCY EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	3.4E-09	--	1.7E-09	--	5.1E-09	NA	--	--	--	--
			Benzo(a)pyrene	4.7E-08	--	2.3E-08	--	7.0E-08	NA	--	--	--	--
			Benzo(b)fluoranthene	1.3E-08	--	6.6E-09	--	2.0E-08	NA	--	--	--	--
			Dibenzo(a,h)anthracene	2.5E-08	--	1.2E-08	--	3.7E-08	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	2.8E-09	--	1.4E-09	--	4.2E-09	NA	--	--	--	--
			Arsenic	4.2E-08	--	4.7E-09	--	4.6E-08	Skin, CVS	0.002	--	0.0002	0.002
			Manganese	--	--	--	--	--	CNS	0.0008	--	--	0.0008
			Mercury	--	--	--	--	--	CNS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	NOAEL	0.003	--	--	0.003
			Chemical Total	1.3E-07	--	5.0E-08	--	1.8E-07		0.008	--	0.0002	0.008
		Exposure Point Total						1.8E-07					0.008
	Exposure Medium Total							1.8E-07					0.008
Medium Total								1.8E-07					0.008
Receptor Total							Receptor Risk Total	1.8E-07				Receptor HI Total	0.008

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3 - NSA	Benzo(a)anthracene	3.8E-08	--	3.4E-09	--	4.1E-08	NA	--	--	--	--
			Benzo(a)pyrene	5.2E-07	--	4.7E-08	--	5.7E-07	NA	--	--	--	--
			Benzo(b)fluoranthene	1.5E-07	--	1.3E-08	--	1.6E-07	NA	--	--	--	--
			Dibenzo(a,h)anthracene	2.7E-07	--	2.5E-08	--	3.0E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	3.1E-08	--	2.8E-09	--	3.4E-08	NA	--	--	--	--
			Arsenic	4.6E-07	--	9.6E-09	--	4.7E-07	Skin, CVS	0.04	--	0.0007	0.04
			Manganese	--	--	--	--	--	CNS	0.01	--	--	0.01
			Mercury	--	--	--	--	--	CNS	0.03	--	--	0.03
			Vanadium	--	--	--	--	--	NOAEL	0.05	--	--	0.05
			Chemical Total	1.5E-06	--	1.0E-07	--	1.6E-06		0.1	--	0.0007	0.1
		Exposure Point Total						1.6E-06					0.1
	Exposure Medium Total							1.6E-06					0.1
Medium Total								1.6E-06					0.1
Receptor Total							Receptor Risk Total	1.6E-06				Receptor HI Total	0.1

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study (TtNUS, 2004).

TABLE 9.5.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
SITE 3 - NSA SOIL ROD
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil/Subsurface Soil	Surface/Subsurface Soil	Site 3	Benzo(a)anthracene	1.4E-08	--	1.4E-09	--	1.5E-08	NA	--	--	--	--
			Benzo(a)pyrene	2.0E-07	--	1.9E-08	--	2.1E-07	NA	--	--	--	--
			Benzo(b)fluoranthene	5.6E-08	--	5.5E-09	--	6.1E-08	NA	--	--	--	--
			Dibenzo(a,h)anthracene	1.0E-07	--	1.0E-08	--	1.1E-07	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.2E-08	--	1.2E-09	--	1.3E-08	NA	--	--	--	--
			Arsenic	1.7E-07	--	3.9E-09	--	1.8E-07	Skin, CVS	0.004	--	0.00009	0.004
			Manganese	--	--	--	--	--	CNS	0.001	--	--	0.001
			Mercury	--	--	--	--	--	CNS	0.003	--	--	0.003
			Vanadium	--	--	--	--	--	NOAEL	0.005	--	--	0.005
			Chemical Total	5.5E-07	--	4.1E-08	--	5.9E-07		0.01	--	0.00009	0.01
		Exposure Point Total						5.9E-07					0.01
	Exposure Medium Total							5.9E-07					0.01
Medium Total								5.9E-07					0.01
Receptor Total							Receptor Risk Total	5.9E-07				Receptor HI Total	0.01

Taken from Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibiltiy Study (TtNUS, 2004).